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RANGELAND DRILL USED IN REFORESTATION IN CALIFORNIA

By

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Forest managers are constantly seeking to improve methods of reforesting idle timberlands. They have tried many methods of planting and seeding over the years. A recent trial of the rangeland drill, widely used for grass seeding, suggests that it may solve some seeding problems. 4/ Preliminary observations of a study installed at Edson Creek on the Shasta-Trinity National Forests in April 1959 look very promising.

The rangeland drill (fig. 1) was specifically designed by the Forest Service for seeding grass on rough rangeland. Available commercial grain drills designed for agricultural use are not built to withstand the hard usage that cannot be avoided on wildland seeding operations. The rangeland drill is custom-fabricated by the Forest Service and is not commercially available at this time. Extensive use has been made of the drill in seeding rehabilitated brush fields for grazing purposes. The drill can be used on most areas in which a tractor can be operated. Stumps and rocks generally do not limit operation of the drill.

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4/ This technique of direct seeding is reported on a preliminary basis for the information of land managers who may wish to try it without waiting for final results.

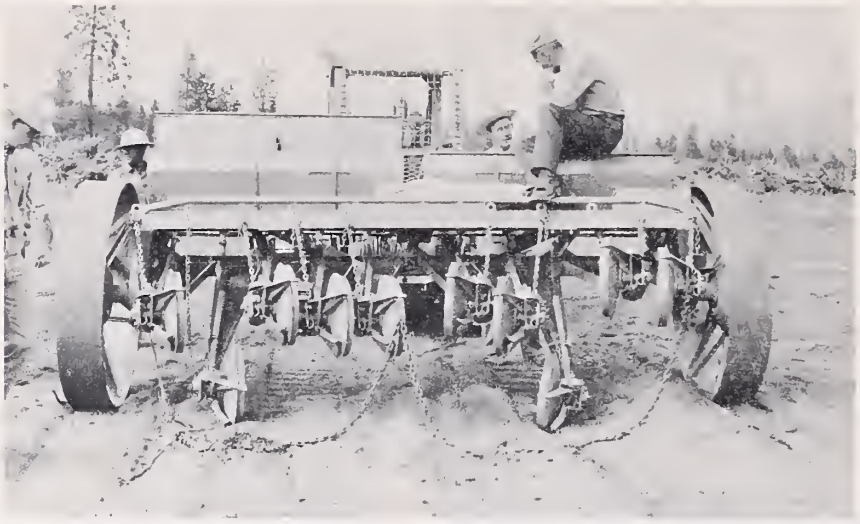

Figure 1. --Rear view of rangeland drill showing two drills used to sow ponderosa pine seed, and log chain used to cover the seed. The machine was designed originally by the Forest Service for sowing seed of forage species.

Figure 2.--Dense brushfield of greenleaf manzanita, snowbrush, and mountain whitethorn.

Figure 3. --Brush eradicated with a bulldozer and windrowed on contours.

The study area had burned about 60 years ago. Before then it supported a medium to heavy stand of ponderosa pine and a lesser understory of several species of shrubs. Herbaceous vegetation was an insignificant component of the original cover. After the burn, however, a rather rapid encroachment of greenleaf manzanita, bitter cherry, snowbrush, and mountain whitethorn produced a very dense brush field (fig. 2).

For this study, brushy cover was uprooted with a dozer and windrowed (fig. 3). The primary objective of this site preparation was to remove the root crowns of the shrubs in order to eliminate competition with tree seedlings for soil moisture.

The drill was calibrated, using dry ponderosa pine seed, to sow about one seed per lineal foot of row. All but two seed openings were blocked off to obtain 8 feet spacing between rows (fig. 1). Stratified seed was used. It had to be separated from the stratifying medium (vermiculite) and surface-dried to permit proper passage through the drill's feed assembly.

Seed was sown at a depth of 1/2 to 1 inch. A log chain, fastened to the rear of the drill, was used to cover the seed. The soil was not compacted around the seed by this method of covering. Consequently some drying of soil and seed results if rain does not fall soon after seeding. Installation of press wheels would overcome this disadvantage.

This technique of drill seeding offers possibilities for either spring or fall planting. For most direct seeding techniques, spring seeding is favored because it shortens the period during which the seeds are subject to depredation by rodents. However, single seeds spaced one foot apart in drilled rows may have a greater chance of being missed than either seeds broadcast on the surface or those planted in groups of 5 in spots prepared by hand. As an added safeguard in this study, all seed other than that used to calibrate the drill was treated with endrin and arasan by John Ludeman of the U. S. Fish and Wildlife Service.

The benefits of fall planting which seeding with the rangeland drill may make available are:

1. A substantial prolongation of the planting season and a consequent reduction in the spring work load.

2. Seed does not require vernalization.

3. Soil covering the seeds does not need to be compacted.

Results of the preliminary trial were very favorable and indicated that:

1. The rangeland drill can be regulated to drop ponderosa pine seed at a rate of about one seed per lineal foot of drill row.

2. The seeds had to be nearly dry to feed properly into the tubes--moist seeds and seeds mixed with moist vermiculite clogged the metering device.

3. A heavy chain, fastened to the rear of the drill, adequately covered the seeds.

4. Seed germination was good. A high percentage of germination and survival is not required for satisfactory stocking because the seeds are well distributed and are sown at the rate of about 5,400 per acre.

Some items which will require further study are:

1. Changes in design or operation of the drill which may improve performance.

2. Kinds of areas in which the drill can be used--slope, number and size of stumps, size of area, etc.

3. Is direct seeding with the rangeland drill more effective than seed spotting by hand--how much?

4. How does direct seeding with the rangeland drill compare in cost with hand methods of planting?

5. When is the best time to drill--spring or fall?

6. Can animal damage to conifers be reduced by sowing browse plants between the rows of trees?

7. How much conifer seed will be needed to get adequate stocking?

Answers to these and other questions are expected from a series of large-scale studies planned during the next two years.